**MSDS of MIBC**

# Substance and company

Product: Methyl Isobutyl Carbinol (4-Methylpentan-2-ol; MIBC)

Supplier: HUNAN KEKAIRUI MATERIALS TECHNOLOGY CO.，LTD

Address: 2nd floor, Control building, R&D of Petrochemical Circular Economy Technology Center, Yueyang Green Chemical Industry Park Changling branch, Hunan

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Manufacturer Name: HUNAN CHANGLIAN NEW MATERIAL TECHNOLOGY CO., LTD

Manufacturer's address: 2nd floor, Control building, R&D of Petrochemical Circular Economy Technology Center, Yueyang Green Chemical Industry Park Changling branch, Hunan

Contact phone number: 86-15173051793

# Hazards identification

Emergency Overview: Flammable Liquid, Category 3, H226

Oral: Acute Toxicity, Category 5, H303

Transdermal: Acute Toxicity, Category 5, H313

Skin irritation, category 3, H316

Eye irritation, category 2A, H319

Inhalation: Specific target organ systemic toxicity, i.e., single exposure, category 3, respiratorytract, H335

GHS hazard category: flammable liquid, category 3 severe eye injury/irritation, category 2

Hazard statement: Flammable liquid and vapors may be harmful when swallowed or in skin contact, causing mild skin irritation, severe eye irritation, and respiratory irritation.

2.1 GHS label elements

2.2 Pictogram

2.3 Signal word: Warning

**[Precaution]**

- Keep away from heat sources, sparks, open flames, and hot surfaces. Do not use tools that are prone to sparking.

- Avoid inhaling dust/smoke/gas/smoke/vapor/spray

- Wear protective gloves/protective clothing/protective goggles/protective masks.

**[Accident Response]**

- Eye contact: Wash carefully with water for a few minutes. If you wear contact lenses and can easily remove them, take out the contact lenses. Continue rinsing.

- Extinguishing media: water spray, carbon dioxide (CO2), foam, dry powder

- If you feel uncomfortable, call the detoxification center or seek medical attention

**[Safe Storage]**

- Seal the container and store it in a well ventilated area

**[Disposal of Waste]**

- Send the contents/containers to an approved waste treatment plant for processing.

- Health hazards: Stimulating the respiratory system and eyes of rabbits; Inhaling vapor can cause drowsiness and dizziness; Repeated skin contact can cause dryness and cracking of the skin

- Environmental hazard: mild bioaccumulation that is easily biodegradable

# Composition/information on ingredients

☑Purity □Mixture

Chemical name：Methyl Isobutyl Carbinol (4-Methylpentan-2-ol)

Items Purity（%） CAS No

Methyl Isobutyl Carbinol ≥99% 108-11-2

# First-aid measures

**[First aid measures]**

- General recommendation: Immediately remove all contaminated clothing and shoes and rinse them

- Inhalation: If inhaling a thin mist, move the patient from the contaminated area to fresh air. If necessary, perform oxygen therapy or artificial respiration for medical monitoring; If symptoms occur, seek medical attention immediately.

- Skin contact: Immediately rinse thoroughly with water and seek medical attention. If there are extensive burns, seek medical attention

- Eye contact: Immediately rinse open eyes thoroughly with water for at least 15 minutes and seek medical attention immediately.

- Ingestion: Do not induce vomiting. Rinse mouth with plenty of water while the injured person is conscious, and then seek medical attention.

**[Advice on protecting rescuers]**

- If entering a saturated environment, wear self-contained breathing apparatus protective clothing

# Firefighting measures

**[Special Danger]**

- Belongs to flammable liquids. Its vapor is heavier than air and can spread along the ground. At a certain distance, the vapor may ignite again. Heating and impregnating insulation materials for a certain period of time can cause spontaneous combustion, and thermal decomposition releases flammable and toxic products such as carbon oxides (through combustion) and organic vapors

- Extinguishing agent: water spray, dry powder, carbon dioxide (CO2), special foam for polar solvent

**[Fire extinguishing precautions and measures]**

- Water spray can be used to cool unopened containers to ensure rapid handling of containers. If there is a fire nearby, remove the container in contact. If a fire occurs, wear a self-contained breathing apparatus and a full set of chemical resistant work clothes.

1. **Emergency leakage treatment**

**[Protective measures, equipment, and emergency response procedures for homework personnel]**

- Ensure sufficient ventilation to evacuate personnel to a safe area

- Prohibit all ignition sources and ignition sources

- Use personal protective equipment to avoid contact with skin and eyes, and avoid inhaling vapors

Environmental protection measures:

- Cover with sand or inert soil (combustible materials are not allowed). Should not be released into the environment to prevent chemicals from entering the sewer system

**[Storage, removal methods, and disposal materials used for spilled chemicals]**

- Recycling: Pump into labeled inert emergency containers. Wet products: using inert adsorbent materials to absorb residues and recover products

- Elimination: Burning treatment products (according to local or national regulations)

1. **Handling and storage**

**[Precautions for Handling Operations]**

- Provide suitable exhaust devices, shower and eye wash equipment at the mechanical equipment site. Provide fire blankets near the water supply system, equip waterproof electrical equipment, and provide electrical grounding for the equipment

- Prohibit all ignition sources and ignition sources. Prohibit the use of air transmission and keep away from open flames. When using metal material systems to transport materials, avoid static electricity accumulation

- Avoid inhaling vapors and strictly prevent them from entering the eyes, skin contact, or clothing. Eating, drinking, and smoking are strictly prohibited during use

- Wash hands after operation, and remove contaminated clothing and protective equipment when entering the dining area.

**[Safe Storage]**

- Moisture and heat resistant storage, remove all ignition sources. Seal the container tightly and place it in a dry, cool, and well ventilated place.

- Install collection tanks and waterproof electrical equipment in the embankment protection area. Provide electrical grounding for equipment and electrical equipment that can be used in explosive environments

- Taboo: Strong oxidizing agent

- Recommended packaging materials: stainless steel, iron, safety glass for small quantities of products

1. **Touch control/individual protection**

|  |  |  |
| --- | --- | --- |
| Occupational exposure limits： |  | |
| MAC(mg/m3)：No | PC-TWA（mg/m3）： | 25 |
| PC-STEL（mg/m3）：40 | TLV-C(mg/m3)： | No |
| TLV-TWA(mg/m3)：No | TLV-STEL(mg/m3)： | No |
| Biological limit: No data available |  | |

**[Engineering Control]**

- Provide sufficient ventilation and/or exhaust in the studio

- Personal protective equipment: low concentration or short-term action, face mask with dedicated filter box, recommended filter type A2B2E2K2P3; High concentration or long-term effect, equipped with a self-contained breathing apparatus

- Hand protection: For intermittent contact, use gloves (PVC, chloroprene rubber, nitrile rubber). According to EN374 penetration index: 1 (penetration time>10 minutes). If in long-term contact, use impermeable butyl rubber gloves

- Eye/face protection equipment: safety goggles with side edges

- Skin and body protection: In the workplace: protective clothing (cotton); Intrusion in case of accident: waterproof clothing

1. **Physical and chemical properties**

Appearance and Characteristics: Colorless liquid form (20 ℃). Mild temperature, similar to alcohol

PH value: No data available Critical temperature (℃): 312

Melting point (℃): -90 Critical pressure (MPa): 4.30

Boiling point (℃): 132 Spontaneous combustion temperature (℃): 335

Flash point (℃): 41 Decomposition temperature (℃): No data available

Explosion upper limit [% (V/V)]: 5.5

Combustion heat (kJ/mol): No data available

Explosion lower limit [% (V/V)]: 1.0 Evaporation rate: No data available

Saturated vapor pressure (kPa): 0.37 (20 ° C)

Flammability: Lower limit 1% (V) 1 Upper limit 5.5% (V)

Relative density (water=1): 0.807 Kinematic viscosity (mm2/s): No data available

Relative vapor density (air=1): 3.52

Odor threshold: No data available

Octanol/water partition coefficient: log Kow: 1.57 (20 ° C)

Ignition temperature (℃): No data available

Bulk density: 807.5 kg/m3 (20 ° C) Water solubility: 21,8g/l,

Extremely soluble (20 ° C)

Dynamic viscosity: 4074-4116 mPa. s (25 ° C)

Molecular weight: 102,18 g/mol

Refractive index: 1411

Solubility: soluble in water and miscible with most commonly used organic solvents such as alcohols, ethers, hydrocarbons, etc

1. **Stability and reactivity**

Reactivity/chemical stability: Under normal operating and storage conditions, the product is stable

Dangerous reaction: No information available

Conditions to avoid contact: Do not approach heat sources and ignition sources

Prohibited substances: strong oxidants, strong acids

Dangerous decomposition products: carbon oxides (through combustion), organic vapors

1. **Toxicological information**

Toxicokinetics (adsorption, metabolism, distribution, and elimination): Large quantities of products can be rapidly absorbed through various pathways. Distributed throughout the body.

**[Acute toxicity]**

- Inhalation: For humans, high concentrations of vapor/mist can cause headaches and dizziness, drowsiness, and loss of consciousness; For animals, under steam conditions, the median lethal concentration (LC50)/4 h/rat:>16 mg/l (Method: OECD Test Guideline 403)

- Ingestion: Irritation to mucous membranes. For animals, LD50/rat: 2.590 mg/kg

- Transdermal: May penetrate the skin. For animals, LD50/rabbit: 2.870 mg/kg

**[Local effects (corrosion/irritation/severe eye damage)]**

- Skin contact: For humans, repeated or long-term contact can cause skin irritation and dermatitis due to the degreasing properties of this product; For animals, skin irritation (OECD guideline 404, rabbits, exposure time: 4 hours)

- Contact with eyes: For humans, eye irritation (exposure to vapor) (0.2 mg/l). For animals, eye irritation (OECD Test Guideline 405, rabbits)

**[Respiratory or skin allergies]**

- Inhalation: No data available

- Skin contact: Non skin allergens. No skin allergic reactions were observed in animals. (Method: OECD Test Guide 406 Guinea Pig Maximum Test)

**[CMR impact]**

- Mutability: According to available experimental data, there is no genetic toxicity

- In vitro: Ames test in vitro: inactive; Eukaryotic cell in vitro chromosomal aberration test: inactive; Eukaryotic cell in vitro gene mutation assay: inactive

- Carcinogenicity: Based on existing data, there is no doubt that this substance has potential carcinogenicity. Can be compared with the test results of similar products:

*4-methyl-2-pentanone: The effects on the liver and lungs observed under high-dose conditions in tumor rat and mouse experiments are limited to these species. In animals, high-dose liver tumors (mice) - kidney tumors (rats) (rats/mice, 2 years, inhaled), no observed adverse effect dose (NOAEL) (1,84 mg/l)*

- Reproductive toxicity: Based on existing data, it cannot be suspected that this substance has potential reproductive toxicity. It can be compared with the test results of similar products.

*4-methyl-2-pentanone, in animals: multi generational reproduction test (Method: OECD Test Guide 416, rats, inhalation), non-toxic to reproductive ability. Under high dosage conditions, it affects offspring. NOAEL (parent): 4.1 mg/l, NOAEL (F1): 4.1 mg/l*

**[Specific target organ systemic toxicity]**

- Single exposure: Stimulating the respiratory system. Stimulating the nose, throat, and respiratory system (>0.2 mg/l)

- Repeated exposure: This substance or mixture is not classified as a specific target organ toxin and is subject to repeated exposure. Repeated exposure through inhalation in animals: no negative effects reported. NOAEL=3,7 mg/l (rats, 6 weeks). Can be compared with the test results of similar products:

*4-methyl-2-pentanone:*

*For humans:*

*Inhalation: Muscle weakness, headache, drowsiness, nausea, nervous system dysfunction*

*In animals:*

*Inhalation: Toxic effects cannot be directly extrapolated and are intended for use in humans*

*Target organs: liver, kidney, NOAEL=1.84 mg/l (450 ppm) (rat/mouse, repeated exposure, 2a)*

*Oral administration: Toxic effects cannot be directly extrapolated and are intended for use in humans*

*Target organs: liver, kidney, NOAEL=250mg/kg bw/day (rat, subchronic, 13 weeks)*

**[Inhalation hazard]**

Not applicable

1. **Ecological information**

**[Acute toxicity]**

- Fish: Mild harm to fish.

LC50, 96 h (golden trout): 359 mg/l (Method: OECD Guideline 203)

No observed effect concentration (NOEC), 96 h (golden trout): 105 mg/l (Method: OECD Guideline 203)

- Aquatic invertebrates: mildly harmful to water fleas

Half lethal effective concentration (EC50), 48 hours (Daphnia magna): 337 mg/l (Method: OECD Test Guideline 202)

No visible effect concentration (NOEC), 48 hours (Daphnia magna): 288 mg/l (Method: OECD Test Guideline 202)

- Aquatic plants: mildly harmful to seaweed

EC r50, 96 h (green algae): 334 mg/l (Method: OECD Test Guideline 201, Growth Inhibition)

No visible effect concentration (NOEC), 96 h (green algae): 75.5 mg/l (Method: OECD Test Guideline 201, Growth Inhibition)

- Microorganisms: No data available

- Activated sludge: EC50, 3 hours:>100 mg/l (Method: OECD Guideline 209, Respiratory Inhibition of Activated Sludge)

**[Water toxicity/long-term toxicity]**

- Aquatic invertebrates: can be compared with the experimental results of similar products:

*4-methyl-2-pentanone:*

*No observed effect concentration (NOEC), 21 days (Daphnia magna): 30-35 mg/l (Method: OECD Guideline 211, Reproductive Inhibition)*

**[Durability and degradability]**

- Biodegradability (in water): 85% of easily biodegradable after the following processes: 28 days (Method: OECD Guideline 301 F)

- The ratio of biochemical oxygen demand to chemical oxygen demand: 0.91% (BOD type: five-day biochemical oxygen demand (BOD5))

**[Bioaccumulation]**

- Bioaccumulation: Mild bioaccumulation. Partition coefficient: n-octanol/water: log Kow: 1.57, at 20 ° C

**[Migration in Soil - Distribution in Different Environmental Segmentation Spaces]**

- Adsorption/desorption: Mild adsorption in soil and sediment, log Koc: 1,11 (method: calculated)

**[Evaluation of PBT and vPvB Results]**

- This substance is not considered a Persistent Bioaccumulation and Toxicity Substance (PBT) or a Strong Persistent Bioaccumulation and Toxicity Substance (vPvB).

1. **Disposal considerations**

**[Product Processing]**

- In possible situations, recycling is better than treating or incinerating products (according to local or national regulations)

**[Packaging]**

- Burning packaging water washing containers at licensed waste disposal sites to recover wastewater for future treatment

1. **Transport information**

**UN Dangerous Goods Number (UN Number)**: 2053

**United Nations shipping name**: Methyl isobutyl carbinal (also known as 4-methyl-2-pentanol)

**United Nations Hazard Classification**: Flammable Liquid Category 3

**Packaging category**: III

**Packaging label**: Flammable liquid

**Packaging method**:

- Small opening steel drum; Ordinary wooden box outside the ampoule bottle; Screw mouth glass bottles, iron cap pressed mouth glass bottles, plastic bottles, or ordinary wooden boxes outside metal drums (cans); Threaded glass bottles, plastic bottles, or tin plated steel drums (cans) are filled with bottom plate flower boxes, fiberboard boxes, or plywood boxes.

**[Transportation precautions]**

- Vibration generates static electricity. It is strictly prohibited to mix and transport with oxidants, edible chemicals, etc.

- During transportation, it should be protected from direct sunlight, rain, and high temperatures.

- When stopping midway, one should stay away from sources of fire, heat, and high temperature areas. The exhaust pipe of the vehicle carrying the item must be equipped with a flame retardant device, and the use of mechanical equipment and tools that are prone to generating sparks for loading and unloading is prohibited.

- During road transportation, it is necessary to follow the prescribed route.

- It is prohibited to slip during railway transportation.

- It is strictly prohibited to use wooden boats or cement boats for bulk transportation.

1. **Regulatory information**

Catalogue of Hazardous Chemicals

List of Toxic Chemicals Strictly Restricted in China: Not Listed

Catalogue of Highly Toxic Substances (2003 Edition by the General Office of the Ministry of Health): Not included in the table

The first category of the list of various monitored chemicals; The second category; The third category; Category 4 (Regulations on the Administration of Controlled Chemicals No. 190): Not listed in the table

Regulations on the Management of Precursor Chemicals, Class I; The second category; Category 3: Not included in the table

List of controlled ozone depleting substances for import and export (1-5): not included in the table

1. **Other information**

Disclaimer: Our company has provided comprehensive and truthful information in the MSDS, but we cannot guarantee its absolute universality and accuracy. This MSDS only provides safety precautions for personnel who have received appropriate professional training and use the product. Individual users who obtain this MSDS must make independent judgments on its applicability under special usage conditions. In special use cases, our company will not be held responsible for any injuries caused by the use of this MSDS.

Fill in the form: August 5th, 2024

Filling in the department: Market Management Department

Fill in the form: Guo Lingyu

Data audit unit: Liu Yan